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EXAMINER	
OREILLY, PATRICK F	
ART UNIT	PAPER NUMBER
3749	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/537,155	LEE ET AL.	
	Examiner	Art Unit	
	Patrick F. O'Reilly III	3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 8-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-17,19-24 and 26* is/are rejected.

7)☒ Claim(s) *18 and 25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 April 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☒ Other: *See Continuation Sheet*.

Continuation of Attachment(s) 6). Other: Appendices A-C and English translation for JP 07-151108 A (non-machine generated translation).

DETAILED ACTION

1. This action is in response to applicant's amendment mailed on April 9, 2007.

Information Disclosure Statement

2. The information disclosure statement filed May 16, 2006 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The Chinese Office Action, which was submitted with the information disclosure statement, should have been listed on PTO-SB08 form under Non-Patent Literature Documents. The examiner is uncertain whether or not the applicant intends the Chinese Office Action to be part of the prior art disclosure. Consequently, the information disclosure statement has been placed in the application file, but the information referred to in this Chinese Office Action has not been considered.

3. The applicant has indicated an attached supplemental information disclosure statement, which lists the Chinese Office Action, but this supplemental information disclosure statement has not been received with this amendment.

Oath/Declaration

4. The oath or declaration is defective. A new oath or declaration in compliance with 37

CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the citizenship of each inventor.

Claim Objections

5. Claim 12 is objected to because of the following informalities: (a) in line 7, the word "mechanism" is misspelled "mechansim" and (b) in Applicants' amendment, this claim is said to have been rewritten in independent form, but the limitations of two claims upon which this claim formerly depended, namely claims 7 and 11, have not been included in the amended independent form of this claim. Appropriate correction is required.

6. Claim 18 is objected to because of the following informality: in line 19, a comma should be added after the word "uniform". Appropriate correction is required.

7. Claim 23 is objected to because of the following informality: in line 2, a colon should be added after the word "from" in order to more clearly indicate that the "blunt body" can be selected from the listed group. Appropriate correction is required.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. **Claims 1-4** are rejected under 35 U.S.C. 102(b) as being anticipated by Ruscheweyh (US 4,498,786). The specification and the drawings in the Ruscheweyh '786 reference disclose all of the elements recited in **claims 1-4** of this application.

10. Specifically, in regard to amended claim 1, which is directed to a flow spreading mechanism, Ruscheweyh '786 discloses at least one inlet (inlet to feed conduit 2) through which a fluid flow (individual stream Q_2) is introduced; a flow separating means (delta-shaped insert element 3) for separating the fluid flow introduced through the at least one inlet into at least two fluid flows (separate streams between the edges of the delta-shaped insert element 3 and the conduit walls); and an outlet (A1, as annotated in attached Appendix A) for discharging at least two of the at least two fluid flows to an outside of the flow spreading mechanism (A3, dashed outline in Appendix A), at least two fluid flows being divided by the flow separating means (3) and joined together at a joining point (A2, as indicated in Appendix A) thereafter, wherein the outlet (A1) is located adjacent to the joining point (A2) where the at least two fluid flows are joined together such that the fluid flow being discharged through the outlet (A1) swings while proceeding due to complex vortices caused by the at least two fluid flows being joined together at the joining point (A2). See Ruscheweyh '786, Figure 1; column 1, lines 24-38; column 4, lines 65-68; and column 5, lines 1-8; also see attached Appendix A (annotated version of Figure 1 in Ruscheweyh '786). Therefore, because all of the elements in claim 1 of this application are disclosed by the Ruscheweyh '786 reference, this claim is rejected in accordance with 35 U.S.C. 102(b).

11. In regard to claim 2, which depends upon claim 1, Ruscheweyh '786 further discloses that the flow separating means comprises a plurality of conduits (main conduit 1 and feed

conduit 2) for providing the flow introduced from the inlet with flow paths. Refer to Ruscheweyh '786, Figure 1; column 4, lines 65-68; and column 5, lines 1-8. Thus, Ruscheweyh '786 meets the language of this claim.

12. In regard to claim 3, which depends upon claim 2, Ruscheweyh '786 further discloses that the number of the inlets is the same as that of the conduits (both main conduit 1 and feed conduit 2 have separate inlets), and each inlet corresponds to each conduit (the inlet through which stream Q_1 is introduced corresponds to main conduit 1, whereas the inlet through which stream Q_2 is introduced corresponds to feed conduit 2). See Ruscheweyh '786, Figure 1; column 4, lines 65-68; and column 5, lines 1-8. Consequently, the Ruscheweyh '786 reference also meets the language set forth in claim 3.

13. In regard to claim 4, which depends upon claim 2, Ruscheweyh '786 further discloses that the flow separating means comprises two conduits (main conduit 1 and feed conduit 2). Refer to Ruscheweyh '786, Figure 1; column 4, lines 65-68; and column 5, lines 1-8. Therefore, Ruscheweyh '786 also meets the language set forth in this claim.

14. **Claims 1, 5-6, 9, 19, 22-23, and 26** are rejected under 35 U.S.C. 102(b) as being anticipated by Ruscheweyh (JP 07-151108 A). The specification and the drawings in the Ruscheweyh '108 reference disclose all of the elements recited in **claims 1, 5-6, 9, 19, 22-23, and 26** of this application.

15. Specifically, in regard to claim 1, which is directed to a flow spreading mechanism, Ruscheweyh '108 discloses at least one inlet (inflow passage 1) through which a fluid flow is introduced; a flow separating means (ellipse or circular inclusion side 4) for separating the fluid flow introduced through the at least one inlet into at least two fluid flows (two streams between

the edges of the ellipse or circular inclusion side 4 and the flow passage 2 walls); and an outlet (B1 at the beginning of outflow passage 3, as annotated in attached Appendix B) for discharging at least two of the at least two fluid flows to an outside of the flow spreading mechanism (B3, dashed outline in Appendix B), at least two fluid flows being divided by the flow separating means (4) and joined together at a joining point (B2, as indicated in Appendix B) thereafter, wherein the outlet (B1) is located adjacent to the joining point (B2) where the at least two fluid flows are joined together such that the fluid flow being discharged through the outlet (B1) swings while proceeding due to complex vortices caused by the at least two fluid flows being joined together at the joining point (B2). See Ruscheweyh '108, Figure 1; column 2, lines 41-50; column 3, lines 1-13; see also attached English translation of Ruscheweyh '108, paragraphs [0012-0014] and attached Appendix B (annotated version of Figure 1 in Ruscheweyh '108). Therefore, because all of the elements in claim 1 of this application are disclosed by the Ruscheweyh '108 reference, this claim is rejected in accordance with 35 U.S.C. 102(b).

16. In regard to claim 5, which depends upon claim 1, Ruscheweyh '108 further discloses that the flow separating means (4) comprises a conduit to form a flow path between the inlet (inflow passage 1) and the outlet (outflow passage 3), and a blunt body (ellipse or circular inclusion side 4) placed inside the conduit to form two separated flow paths (two streams between the edges of the ellipse or circular inclusion side 4 and the flow passage walls 2) inside the conduit. Refer to Ruscheweyh '108, Figure 1; column 2, lines 41-50; column 3, lines 1-13; see also attached English translation of Ruscheweyh '108, paragraphs [0012-0014]. Thus, Ruscheweyh '108 meets the language of this claim.

17. In regard to claim 6, which depends upon claim 5, Ruscheweyh '108 further discloses that the two separated flow paths (two streams between the edges of the ellipse or circular inclusion side 4 and the flow passage walls 2) are formed extending in a part (2) of the conduit. See Ruscheweyh '108, Figure 1; column 2, lines 41-50; column 3, lines 1-13; see also attached English translation of Ruscheweyh '108, paragraphs [0012-0014]. Consequently, the Ruscheweyh '108 reference also meets the language set forth in claim 6.

18. In regard to claim 9, which depends upon claim 6, Ruscheweyh '108 further discloses that the blunt body is columnar (ellipse or circular inclusion side 4) with its longitudinal axis substantially perpendicular to the direction of the flow inside the conduit (major axis of ellipse 4 is perpendicular to the flow arrows in inflow passage 1). See Ruscheweyh '108, Figure 1; column 2, lines 41-50; column 3, lines 1-13; see also attached English translation of Ruscheweyh '108, paragraphs [0012-0014]. Thus, Ruscheweyh '108 meets the language of claim 9.

19. In regard to claim 19, which depends upon claim 1, Ruscheweyh '108 further discloses that a heat exchanger comprises a flow spreading mechanism as recited in claim 1. Refer to Ruscheweyh '108, column 1, lines 29-43; see also attached English translation of Ruscheweyh '108, paragraphs [0001-0002]. Consequently, the Ruscheweyh '108 reference also meets the language set forth in claim 19.

20. In regard to new independent claim 22, Ruscheweyh '108 discloses all of the claimed elements, including: a conduit (2) having an inlet (inflow passage 1) and an outlet (B1 at the beginning of outflow passage 3, as annotated in attached Appendix B); and a blunt body (ellipse or circular inclusion side 4) placed inside the conduit (2) and configured to break an inlet fluid flow coming from the inlet (inflow passage 1) into at least two separate fluid flows (two streams

between the edges of the ellipse or circular inclusion side 4 and the flow passage 2 walls) and then join the at least two separate fluid flows at a joining point (B2, as indicated in Appendix B) thereafter into a discharge fluid flow discharged through the outlet (B1), wherein the outlet (B1) of the conduit (2) is located adjacent to the joining point (B2) where the at least two fluid flows are joined together such that the discharged fluid flow being discharged through the outlet (B1) swings while proceeding due to complex vortices caused by the at least two fluid flows being joined together at the joining point. See Ruscheweyh '108, Figure 1; column 2, lines 41-50; column 3, lines 1-13; see also attached English translation of Ruscheweyh '108, paragraphs [0012-0014] and attached Appendix B (annotated version of Figure 1 in Ruscheweyh '108). Therefore, because all of the elements in claim 22 of this application are disclosed by the Ruscheweyh '108 reference, this claim is rejected in accordance with 35 U.S.C. 102(b).

21. In regard to claim 23, which depends upon claim 22, Ruscheweyh '108 further discloses that the blunt body (4) comprises a semi-circle-shaped body, a circle-shaped body, or an oval-shaped body (ellipse or circular inclusion side 4). Refer to Ruscheweyh '108, Figure 1; see also attached English translation of Ruscheweyh '108, paragraph [0009]. Thus, Ruscheweyh '108 meets the language of this claim.

22. In regard to claim 26, which depends upon claim 23, Ruscheweyh '108 further discloses that distance (dimension B4 in Appendix B) between the blunt body (4) and the outlet (B1) is smaller than a width of the outlet (B1). See attached Appendix B (annotated version of Figure 1 in Ruscheweyh '108). Consequently, the Ruscheweyh '108 reference also meets the language set forth in claim 26.

Claim Rejections - 35 USC § 103

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

24. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ruscheweyh (JP 07-151108 A) in view of Nawa et al. (US 4,327,869). These two references, when considered together, teach all of the elements recited in **claim 8** of this application.

25. In particular, claim 8 of this application is obvious when Ruscheweyh '108 is viewed in light of Nawa et al. As described above, Ruscheweyh '108 discloses all the limitations of claim 6, the claim upon which this claim depends. However, claim 8 further discloses that the blunt body is a plate which is substantially perpendicular to the direction of the flow inside the conduit. Ruscheweyh '108 does not contain these additional limitations. Nawa et al., although, teaches a blunt body in the form of a plate (flat control vane 11) which is substantially perpendicular to the direction of the flow (a_4) inside the conduit (fluid passage or duct 10 formed by walls 2, 3, 5, and 6). Refer to Nawa et al., Figure 2(d); column 2, lines 47-68; and column 3, lines 1-2. Nawa et al. is analogous prior art under 35 U.S.C. 103 because the fluid spreading mechanism disclosed in this application and the fluid deflecting assembly in Nawa et al. are from the same field of endeavor, namely devices capable of controlling the diffusion of air. See Nawa et al., column 1, lines 5-7. Moreover, there is sufficient motivation to combine Nawa et al. with Ruscheweyh '108 because Nawa et al. teaches a plate which is substantially perpendicular to the direction of the flow inside the conduit thereby enabling the fluid deflecting device to deliver a

more divergent flow of air by creating two separate flows. Refer to Nawa et al., column 2, lines 65-68 and column 3, lines 1-2. Therefore, when Ruscheweyh '108 is viewed in light of Nawa et al., it would have been obvious to one having ordinary skill in the art at the time the invention was made to add a plate oriented substantially perpendicular to the fluid flow, as suggested by Nawa et al., to the flow spreading mechanism disclosed by Ruscheweyh '108 in order to create a more divergent fluid flow pattern at the outlet of the device. See Nawa et al., column 2, lines 65-68 and column 3, lines 1-2.

26. **Claims 10 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruscheweyh (JP 07-151108 A) in view of the embodiment depicted in Figure 15 of Ruscheweyh (US 4,498,786). These two references, when considered together, teach all of the elements recited in **claims 10 and 24** of this application.

27. In particular, claims 10 and 24 of this application are obvious when Ruscheweyh '108 is viewed in light of the embodiment depicted in Figure 15 of Ruscheweyh '786. As described above, Ruscheweyh '108 discloses all the limitations of claims 6 and 22, the two claims upon which these claims respectively depend. However, claims 10 and 24 further disclose that the ends of the conduit on the side of the outlet are symmetrically bent toward the centerline. Ruscheweyh '108 does not contain this additional limitation. Although, the embodiment depicted in Figure 15 of Ruscheweyh '786 teaches that the ends of the conduit (main conduit 1) on the side of the outlet (outlet conduit 1a) are symmetrically bent toward the center of the conduit so that the width of the outlet (outlet conduit 1a) is smaller than the width of the conduit (main conduit 1). Refer to Ruscheweyh '786, Figure 15 and column 7, lines 58-60. Ruscheweyh '786 is analogous prior art under 35 U.S.C. 103 because the fluid spreading mechanism disclosed

in this application and the fluid mixing apparatus in Ruscheweyh '786 are from the same field of endeavor, namely devices capable of mixing and spreading fluid streams. See Ruscheweyh '786, column 1, lines 24-38. Moreover, there is sufficient motivation to combine the embodiment depicted in Figure 15 of Ruscheweyh '786 with Ruscheweyh '108 because the embodiment depicted in Figure 15 of Ruscheweyh '786 teaches a main conduit with convergent walls for the purpose of forming a constricted outlet with a higher resultant discharge velocity. Refer to Ruscheweyh '786, column 4, lines 48-49 and column 7, lines 58-60. Therefore, when Ruscheweyh '108 is viewed in light of the embodiment depicted in Figure 15 of Ruscheweyh '786, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the flow spreading mechanism disclosed by Ruscheweyh '108 with symmetrical, convergent walls immediately upstream of the outlet, as taught by the embodiment depicted in Figure 15 of Ruscheweyh '786, in order to form a constricted outlet with a fluid velocity higher than the velocity upstream of the flow separating means. See Ruscheweyh '786, column 4, lines 48-49 and column 7, lines 58-60.

28. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ruscheweyh (JP 07-151108 A) in view of the embodiment depicted in Figure 15 of Ruscheweyh (US 4,498,786) as applied to claim 10, and further in view of Nawa et al. (US 4,327,869). These three references, when considered together, teach all of the elements recited in **claim 11** of this application.

29. In particular, claim 11 of this application is obvious when Ruscheweyh '108 is viewed in light of the embodiment depicted in Figure 15 of Ruscheweyh '786, and further viewed in light of Nawa et al. Ruscheweyh '108, as modified by the embodiment in Figure 15 of Ruscheweyh

'786, lacks a blunt body in the form of a plate having a uniform width and an orientation that is substantially perpendicular to the direction of the flow. Although, Nawa et al. teaches a blunt body in the form of a plate (flat control vane 11) which is substantially perpendicular to the direction of the flow (a_4) inside the conduit (fluid passage or duct 10 formed by walls 2, 3, 5, and 6), and the width of which is uniform (Fig. 1). Refer to Nawa et al., Figures 1 and 2(d); column 2, lines 47-68; and column 3, lines 1-2. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the flow spreading mechanism having convergent conduit walls immediately upstream of the outlet, as modified by Ruscheweyh '786, with a plate having a uniform width and an orientation that is substantially perpendicular to the fluid flow, as taught by Nawa et al., in order to create a more divergent outlet flow pattern in the plane parallel to the flow direction and a more uniform outlet flow pattern in the plane perpendicular to the flow direction. See Nawa et al., Figure 2(d).

30. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ruscheweyh (JP 07-151108 A) in view of the embodiment depicted in Figure 15 of Ruscheweyh (US 4,498,786), and the embodiment depicted in Figure 7 of Ruscheweyh '786. These two references and the two embodiments in the second reference, when considered together, teach all of the elements recited in **claim 12** of this application.

31. Claim 12 is obvious when Ruscheweyh '108 is viewed in light of the embodiment depicted in Figure 15 of Ruscheweyh '786, Nawa et al., and the embodiment depicted in Figure 7 of Ruscheweyh '786. Ruscheweyh '108 discloses the invention substantially as claimed, including: at least one inlet (inflow passage 1) through which a fluid flow is introduced; a flow separating means (ellipse or circular inclusion side 4) for separating the fluid flow

introduced through the at least one inlet into at least two fluid flows (two streams between the edges of the ellipse or circular inclusion side 4 and the flow passage 2 walls); and an outlet (B1 at the beginning of outflow passage 3, as annotated in attached Appendix B) for discharging at least two of the at least two fluid flows to an outside of the flow spreading mechanism (B3, dashed outline in Appendix B), at least two fluid flows being divided by the flow separating means (4) and joined together thereafter (at joining point B2, as indicated in Appendix B), wherein complex vortices are formed adjacent to the outlet (B1) and thus, the fluid flow being discharged through the outlet (B1) swings while proceeding, the flow separating means (4) comprises a conduit (2) to form a flow path between the inlet (inflow passage 1) and the outlet (outflow passage 3), and a blunt body (ellipse or circular inclusion side 4) placed inside the conduit to form two separated flow paths (two streams between the edges of the ellipse or circular inclusion side 4 and the flow passage walls 2) inside the conduit, and the two separated flow paths (two streams between the edges of the ellipse or circular inclusion side 4 and the flow passage walls 2) are formed extending in a part of the conduit (2). See Ruscheweyh '108, Figure 1; column 2, lines 41-50; column 3, lines 1-13; see also attached English translation of Ruscheweyh '108, paragraphs [0012-0014] and attached Appendix B (annotated version of Figure 1 in Ruscheweyh '108). However, claim 12 further discloses that the flow spreading mechanism includes a conduit with symmetrically bent ends on the side of the outlet, a blunt body placed inside the conduit to form two separated flow paths inside the conduit, and an interval between the plate and the outlet that is set smaller than the width of the outlet so that the flow path from both sides of the plate to the outlet function as nozzles. Ruscheweyh '108 does not contain these additional limitations. Although, the embodiment depicted in Figure 15 of

Ruscheweyh '786 teaches that the ends of the conduit (main conduit 1) on the side of the outlet (outlet conduit 1a) are symmetrically bent toward the center of the conduit so that the width of the outlet (outlet conduit 1a) is smaller than the width of the conduit (main conduit 1) for the purpose of forming a constricted outlet with a higher resultant discharge velocity. Refer to Ruscheweyh '786, Figure 15; column 4, lines 48-49; and column 7, lines 58-60. Moreover, the embodiment depicted in Figure 7 of Ruscheweyh '786 teaches that an interval between the plate and the outlet (space between the top edge of delta-shaped insert element 3 and the point at which feed conduit 2b meets main conduit 1 – dimension C4 in Appendix C) that is set smaller than the width of the outlet (width of main conduit 1 – dimension C5 in Appendix C) such that the flow path from the both sides of the plate to the outlet functions as nozzles (a diverging nozzle is formed between the delta-shaped insert element 3 and the upper wall of the feed conduit 2b, while, on the opposite side of the element 3, a converging nozzle is formed between the element and the lower wall of the feed conduit 2b) for the purpose of increasing the discharge velocity of fluid stream and facilitating spreading and mixing. See Ruscheweyh '786, Figure 7; see also attached Appendix C (annotated version of Figure 7 in Ruscheweyh '786). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the flow spreading mechanism of Ruscheweyh '786, with symmetrically bent ends on the side of the outlet, as taught by the embodiment depicted in Figure 15 of Ruscheweyh '786, and with an interval between the blunt body and the outlet that is set smaller than the width of the outlet, as taught by the embodiment depicted in Figure 7 of Ruscheweyh '786, in order to form a constricted outlet with a higher resultant fluid discharge velocity so that the spreading and mixing of the discharged fluid is facilitated. Refer to Ruscheweyh '786, column 6, lines 30-35.

32. **Claims 13-15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruscheweyh (JP 07-151108 A) in view of the embodiment depicted in Figure 15 of Ruscheweyh (US 4,498,786) and further in view of Nawa et al. (US 4,327,869). These three references, when considered together, teach all of the elements recited in **claims 13-15** of this application, except for specific dimensional relationships among the plate, inlet, outlet, conduit, and the interval between the plate and the outlet. These dimensional relationships among the aforementioned elements of the flow spreading mechanism merely constitute the optimization of design parameters.

33. In particular, claim 13, which depends on claim 11, is unpatentable over Ruscheweyh '108 in view of the embodiment depicted in Figure 15 of Ruscheweyh '786, and further in view of Nawa et al. Ruscheweyh '108, as modified by the embodiment depicted in Figure 15 of Ruscheweyh '786 and Nawa et al., teaches all of the elements of claim 13, except for the plate, outlet, and inlet all having the same width. It has been held that "[w]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation". See MPEP § 2144.05(II)(A) (quoting *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). However, it has further been held that "[a] particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. Refer to MPEP § 2144.05(II)(B) (quoting *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). In regard to claim 13 of this application, the prior art discloses that width of the plate, outlet, and inlet are variable dimensional parameters. Refer to Ruscheweyh '786, Figures 1, 7, and 15; column 1, lines 24-30.

Moreover, the widths of the plate, outlet, and inlet are all result-effective variables because the prior art teaches that certain specific flow patterns and eddy currents are able to be formed downstream of the flow separating means (delta-shaped insert element 3) as a result of varying these three widths. See Ruscheweyh '786, Figures 1, 7, and 15. Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the plate, outlet, and inlet all the same width because the selection of these particular widths merely constitutes the optimization of design parameters which fails to patentably distinguish claim 13 in this application over the flow spreading mechanism of Ruscheweyh '108, as modified by Ruscheweyh '786 and Nawa et al.

34. Claim 14, which depends on claim 13, is unpatentable over Ruscheweyh '108 in view of the embodiment depicted in Figure 15 of Ruscheweyh '786, and further in view of Nawa et al. Ruscheweyh '108, as modified by the embodiment depicted in Figure 15 of Ruscheweyh '786 and Nawa et al., teaches all of the elements of claim 14, except for the portion of the conduit, which has a different width than that of the inlet, having a length that is 1 to 1.5 times the width of the inlet and a width that is 2 to 2.5 times the width of the inlet. The prior art discloses that the length and the width of the aforesaid portion of the conduit are variable, result-effective dimensional parameters because certain specific flow patterns and eddy currents are able to be formed downstream of the flow separating means (delta-shaped insert element 3) as a result of varying this particular length and width. Refer to Ruscheweyh '786, Figures 1, 7, and 15; column 1, lines 24-30. Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the portion of the conduit, which has a different width than that of the inlet, with a length that is 1 to 1.5 times the width of the inlet and

a width that is 2 to 2.5 times the width of the inlet because the selection of this particular length and width merely constitutes the optimization of design parameters which fails to patentably distinguish claim 14 in this application over the flow spreading mechanism of Ruscheweyh '108, as modified by Ruscheweyh '786 and Nawa et al.

35. Claim 15, which depends on claim 14, is unpatentable over Ruscheweyh '108 in view of the embodiment depicted in Figure 15 of Ruscheweyh '786, and further in view of Nawa et al. Ruscheweyh '108, as modified by the embodiment depicted in Figure 15 of Ruscheweyh '786 and Nawa et al., teaches all of the elements of claim 15, except for the interval between the plate and the outlet being about 0.5 times the width of the outlet. The prior art discloses that the interval between the plate and the outlet is a variable, result-effective dimensional parameter because certain specific flow patterns and eddy currents are able to be formed downstream of the flow separating means (delta-shaped insert element 3) as a result of varying this interval. Refer to Ruscheweyh '786, Figures 1 and 7; column 1, lines 24-30. Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make the interval between the plate and the outlet about 0.5 times the width of the outlet because the selection of this particular interval merely constitutes the optimization of a design parameter which fails to patentably distinguish claim 15 in this application over the flow spreading mechanism of Ruscheweyh '108, as modified by Ruscheweyh '786 and Nawa et al.

36. **Claims 16-17 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ruscheweyh (JP 07-151108 A) in view of Rydahl (US 4,304,098). These two references, when considered together, teach all of the elements recited in **claims 16-17 and 20** of this application.

37. In particular, claim 16 of this application is obvious when Ruscheweyh '108 is viewed in light of Rydahl. As described above, Ruscheweyh '108 discloses all the limitations of claim 1, the claim upon which this claim depends. However, claim 16 further discloses that the flow spreading mechanism comprises at least one sink with an opening for discharging the fluid inside the space to the outside. Ruscheweyh '108 does not contain this additional element. Rydahl, although, teaches a flow spreading mechanism (specially constructed guide 51 is the flow separating means) wherein the outlet (upper opening of channel 34) is installed in a space (space bounded by walls 35-37 and bottom surface 38), and wherein the flow spreading mechanism further comprises at least one sink (guide 28) installed at a predetermined location inside the space, the sink (guide 28) comprising an opening for discharging the fluid (49) inside the space to the outside (channel section 46,47). Refer to Rydahl, Figure 2; column 3, lines 53-59; and column 4, lines 6-17. Rydahl is analogous prior art under 35 U.S.C. 103 because the fluid spreading mechanism disclosed in this application and the freezer chest flow apparatus in Rydahl are from the same field of endeavor, namely devices capable of improving air flow circulation in refrigerators and freezers. See Rydahl, column 1, lines 46-50. Moreover, there is sufficient motivation to combine Rydahl with Ruscheweyh '108 because Rydahl teaches a flow spreading mechanism with a sink for providing another means by which the direction of the air flow inside a space may be controlled and its diffusion may be improved. Refer to Rydahl, column 4, lines 6-17. Therefore, when Ruscheweyh '108 is viewed in light of Rydahl, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add a sink installed at a predetermined location inside the space, as suggested by Rydahl, to the flow

spreading mechanism disclosed by Ruscheweyh '108 in order to further enhance the diffusion of the air flow inside that space. See Rydahl, column 4, lines 6-17.

38. In regard to claim 17, which depends on claim 16, Rydahl further teaches that the number of the at least one sink (guide 28) is even-numbered (two), and each pair of the sinks (guides 28) are installed to face each other in a line traverse to the movement direction of the flow (as shown by arrows 48) discharged through the outlet (upper opening of channel 34). Refer to Rydahl, Figure 2; column 4, lines 6-17. Therefore, when Ruscheweyh '108 is viewed in light of Rydahl, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add a pair of sinks, which face each other and are both traverse to the direction of the discharge air flow at the outlet, as suggested by Rydahl, to the flow spreading mechanism disclosed by Ruscheweyh '108 in order to further enhance the space air diffusion on both sides of the aforesaid outlet. See Rydahl, column 4, lines 6-17.

39. In regard to claim 20, which depends on claim 1, Rydahl further teaches that a refrigerator (freezer) comprises a flow spreading mechanism as recited in claim 1. Refer to Rydahl, column 2, lines 14-17 and column 4, lines 6-17. Consequently, Ruscheweyh '108 in view of Rydahl also teaches the language of claim 20.

40. **Claim 21** is rejected under 35 U.S.C. 103(a) as being unpatentable over Ruscheweyh (JP 07-151108 A) in view of Sugawara et al. (US 4,556,172). These two references, when considered together, teach all of the elements recited in **claim 21** of this application.

41. In particular, claim 21 of this application is obvious when Ruscheweyh '108 is viewed in light of Sugawara et al. As described above, Ruscheweyh '108 discloses all the limitations of claim 1, the claim upon which this claim depends. However, claim 21 further discloses that an

air conditioner comprises a flow spreading mechanism as recited in claim 1. Ruscheweyh '108 does not contain this additional element. Sugawara et al., although, teaches an air conditioner with a flow direction controller disposed at its blow-out portion, which controller also includes flow separating means. See Sugawara et al., Figures 5 and 8 and column 1, lines 5-8. Sugawara et al. is analogous prior art under 35 U.S.C. 103 because the fluid spreading mechanism disclosed in this application and the flow direction controller in Sugawara et al. are from the same field of endeavor, namely flow directing means for air conditioners. Refer to Sugawara et al., column 1, lines 5-8. Moreover, there is sufficient motivation to combine Sugawara et al. with Ruscheweyh '108 because Sugawara et al. teaches that a flow spreading mechanism, such as the one disclosed by Ruscheweyh '108, is preferably incorporated in an air conditioner in order to obtain a uniform space temperature distribution. See Sugawara et al., column 1, lines 9-15. Therefore, when Ruscheweyh '108 is viewed in light of Sugawara et al., it would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the flow spreading mechanism disclosed by Ruscheweyh '108 in an air conditioner, as suggested by Sugawara et al., for the purpose of attaining a uniform temperature distribution in the room being air conditioned. Refer to Sugawara et al., column 1, lines 9-15.

Allowable Subject Matter

42. **Claim 18** is objected to as a result of the grammatical informality listed above, but would be allowable if this grammatical informality is corrected.

43. **Claim 25** is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

44. Applicant's arguments with respect to the rejections under 35 U.S.C. 102(b) and 35 U.S.C. 103(a) have been considered but are moot in view of the revised ground(s) of rejection for amended claims 1 and 12 (refer to rejections provided above).

Conclusion

45. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick F. O'Reilly III whose telephone number is (571) 272-3424. The examiner can normally be reached on Monday through Friday, 8:30 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Rinehart can be reached on (571) 272-4881. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

PFO3
pfo3

KENNETH RINEHART
PRIMARY EXAMINER

Appendix A

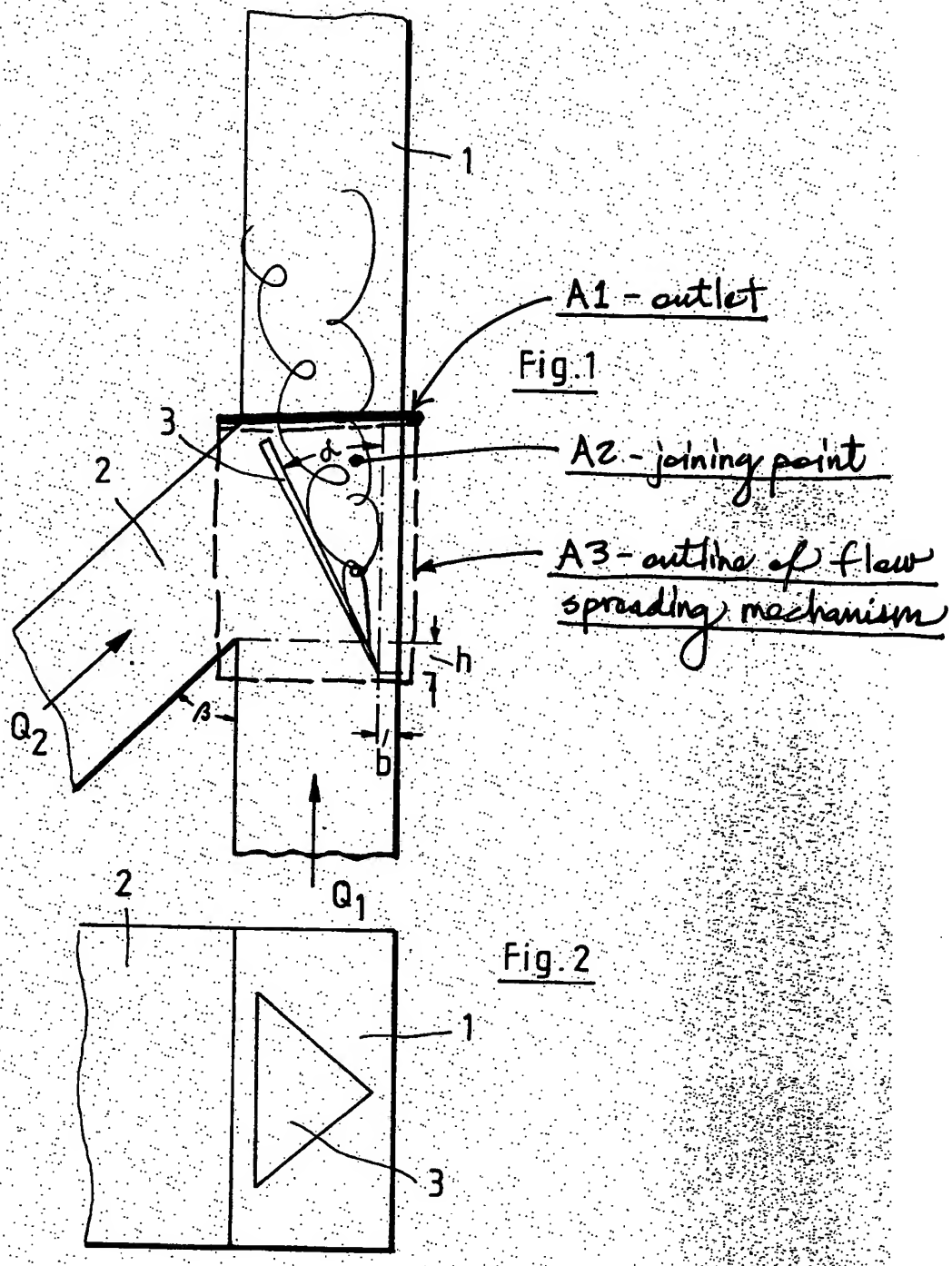

Fig. 1

Fig. 2

Appendix B

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軸線とがずれているので，非対称に広がる流れ部分２が生ずる。

【００１４】図１による第１の実施例では，広がる流れ部分２に長円形又は円形の組込み面４が，主流れ方向に対して鋭角をなして設けられているので，その対称な前縁にはそれぞれ１つの渦伴流が生ずる。図に記入されている渦はいわゆる前縁乱流を形成し，主流れ方向に対して直角に広がり，その結果流れの損失のない広がりを生ずるので，強く広がる流れ部分２でも，流れがデイフユーザの壁に接する。こうして流れが均一にかつ少ない損失で流れ断面に分布し，組込み面４を組込むため避けられない流れ損失にもかかわらず，流れ損失を少なくとも補償する圧力回復を行う。

【００１５】図２による第２の実施例では，広がる流れ部分２においてデイフユーザの中心軸線に対して対称に２つの組込み面４が設けられて，それぞれ定常前縁乱流を生ずる。

【００１６】図３による第３の実施例では，流入通路１の流れの延長部に組込み面４が設けられ，広がる流れ部分２の広がる壁の範囲に別の組込み面４が設けられている。この場合両方の組込み面４の位置と大きさは，デイフユーザの広がる流れ部分２の非対称性に合わされて，デイフユーザのこの特別な構成でも，断面の広がるデイフユーザ壁へ流れがよく接するようにしている。

【００１７】図４による第４の実施例では，広がる流れ部分２内にそれぞれ２つの組込み面４が横に並んで設けられ，その後にも２つの組込み面４が横に並んで設けられ，流れ方向において前にある組込み面４は円形又は楕円形の基本形状を持ち，その後にある組込み面４は三角形の基本形状を持つように形成されている。この実施例でも各組込み面４は前述した性質及び利点を持つ定常前縁乱流を生ずる。

【００１８】図５及び６による実施例では，広がる流れ部分２の入口範囲に長円形又は円形の基本形状を持つ４

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つの組込み面４が設けられ，広がる流れ部分２のこの入口範囲は隔壁５により４つの通路部分に分割されている。これらの隔壁５によつて，それぞれの組込み面４により広がる流れ部分２の入口範囲に生ずる前縁乱流相互の影響が防止される。

【００１９】図７ないし１０は組込み面４の構成の４つの実施例を示している。図７に示す組込み面４は三角形の基本形状を持ち，図８による組込み面４は菱形に形成されている。図９及び１０はそれぞれ楕円及び円形の組込み面４を示している。

【図面の簡単な説明】

【図１】１つの組込み面を持つデイフユーザの第１実施例の中心軸線に沿う断面図である。

【図２】２つの組込み面を持つデイフユーザの第２実施例の中心軸線に沿う断面図である。

【図３】非対称なデイフユーザの第３実施例の中心軸線に沿う断面図である。

【図４】４つの組込み面を持つデイフユーザの第４実施例の中心軸線に沿う断面図である。

【図５】隔離された通路部分に設けられる４つの組込み面を持つデイフユーザの第５実施例の中心軸線に沿う断面図である。

【図６】図５のＶＩ－ＶＩ線によるデイフユーザの断面図である。

【図７】三角形の基本形状を持つ組込み面の第１実施例の正面図である。

【図８】菱形組込み面の第２実施例の正面図である。

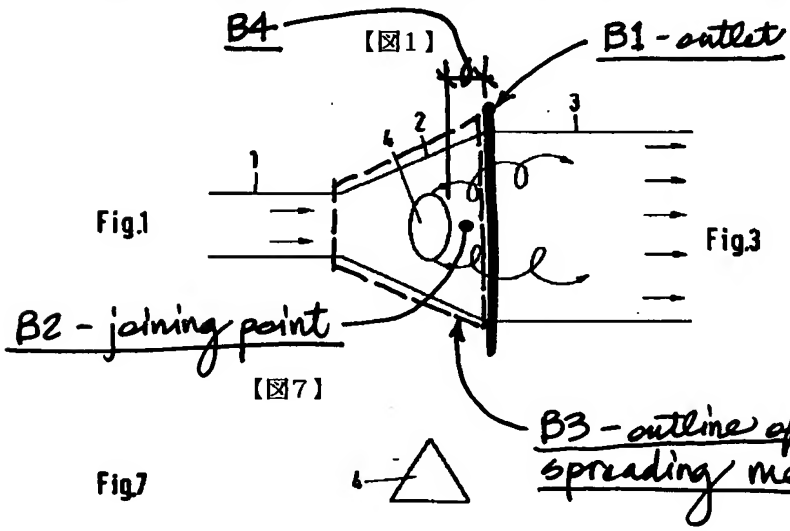
【図９】楕円形の基本形状を持つ組込み面の第３実施例の正面図である。

【図１０】第４実施例としての円形組込み面の正面図である。

【符号の説明】

２　広がる流れ部分

４　組込み面



【図１】

Fig.1

【図３】

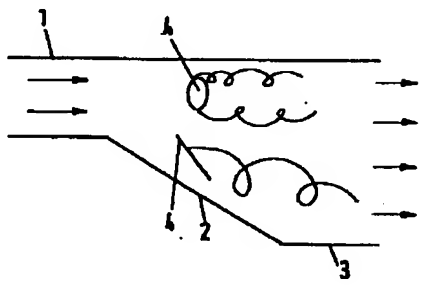


Fig.3

【図７】

Fig.7

Appendix C

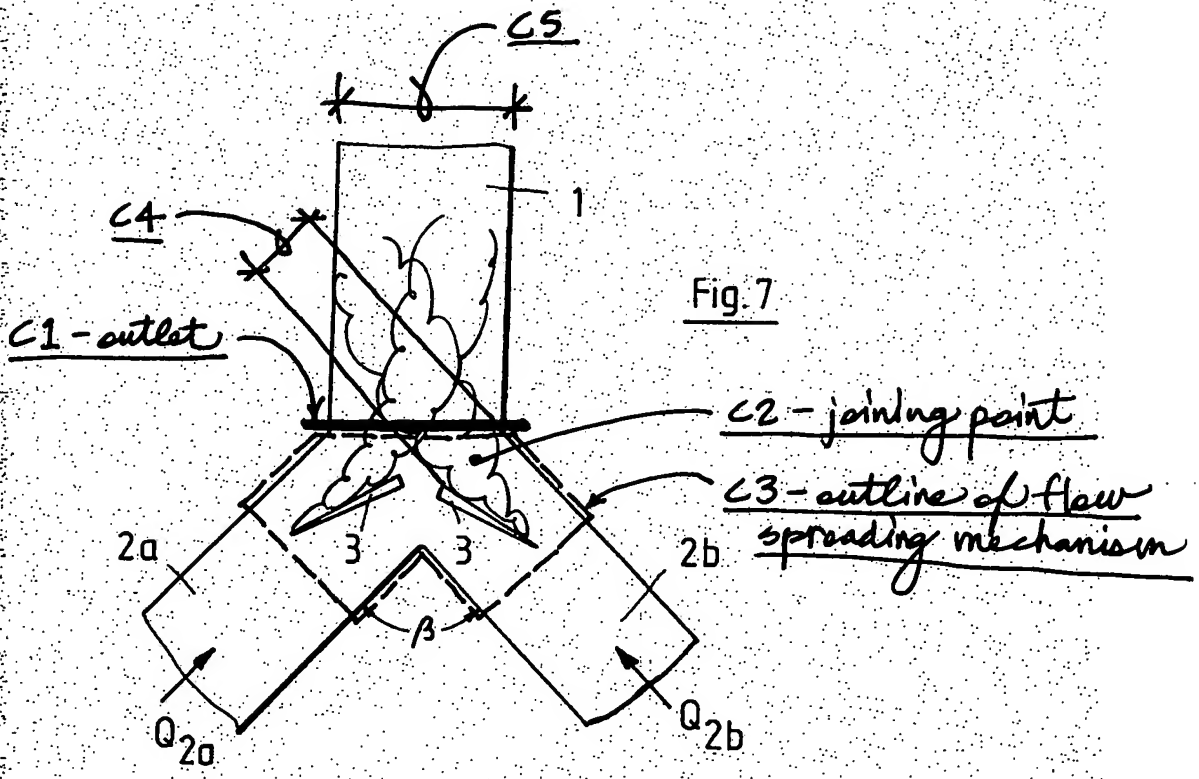


Fig. 7

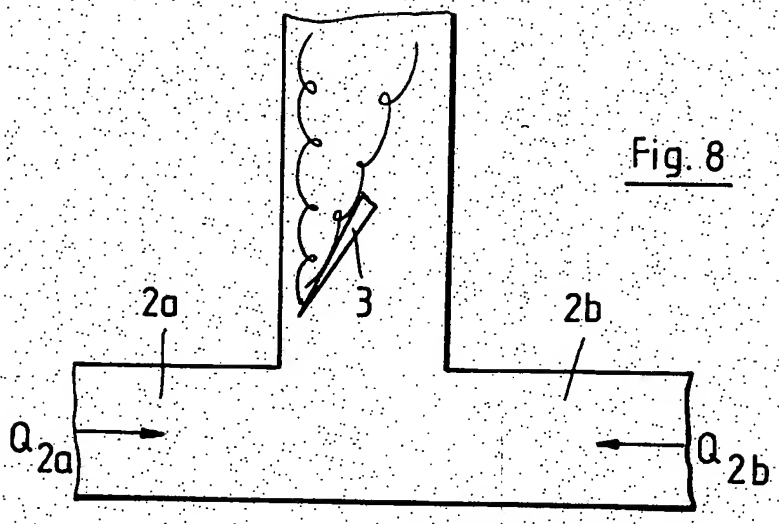


Fig. 8